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Physical Activity and Anthropometric Characteristics in Volleyball Players

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ABSTRACT: Volleyball is one of the most practiced sports in the Albania by different age groups. The purpose of the study is to identify and compare the impact of anthropometric characteristics and physical abilities of volleyball players in the age group of 13-15 years. Assessment of physical abilities is necessary to be carried out every year in different age groups by coaches. Method; The subjects in this study are (No= 30) volleyball players aged 13-15 years, belonging to two Volleyball Sports Associations in Albania. Anthropometric measurements; Body Height (BH), Body Weight (BW) and Body Mass (BMI% kg/m2). Assessment of physical abilities; jump attack, block jump, T-Test and Speed 10 x 5m. Results; According to the results obtained from the tests performed, they do not show any statistical difference in the anthropometric measurements of this age group. Comparative differences between the two Sports Associations were evident in the physical activity tests, especially in the speed tests of the volleyball players. Conclusions; at the end of this study, we come to the conclusion that the values obtained by the volleyball players are statistically low between the age categories for the measurements of the components of physical abilities. We think that special training programs for the development of physical skills should be designed and suggested to be implemented by coaches.

KEYWORDS: volleyball, T-Test, jump, speed

I. INTRODUCTION

In team sports such as volleyball, football, basketball, in addition to other technical elements contained in the type of sport itself, the functioning of the "Vertical Jump" element is also noted. Volleyball is a team sport like other sports such as football, basketball, etc, [1]. An important trend in world volleyball, in addition to improving the body height of players, is the increase in the level of vertical jump, but not only jumping is also agility or speed. Volleyball belongs to sports activities in which the anthropometric characteristics of its participants affect the level of sports performance. [2] evaluated the relationship between anthropometric measurements and vertical jump in volleyball players. Their results showed that anaerobic power was significantly higher in tall players compared to short players. [3]) showed that there is a positive correlation between anthropometric characteristics and vertical jump as one of the most important functional movements in a volleyball game. ([4] showed that there is a positive relationship between the player's height and the maximum jump during hitting and defending during the game. Several studies have investigated the body composition of female volleyball players according to [5,6] These studies have analysed the differences between volleyball and other sports, between female volleyball players and untrained individuals, body composition in relation to the playing position of the players, the effect of training on body composition and the occurrence of injuries, or the effect of body composition on the physical fitness of the players. Vertical jump assessment has been widely used as an alternative to the direct maximal assessment of lower extremity strength and power [7]. The rate of force development is the development of maximal force in minimal time and is commonly used as an index of explosive power [8]. Komi & Bosco compared vertical jump performance in men and women in three specific tests; SJ, CMJ and DJ where men performed higher than women, but women had a better use of stored elastic energy [9]. It has previously been reported [10] that a moderate relationship between strength/power measurements in jump performance in squat jump and CMJ in elite volleyball teams.Vertical jump assessment has

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been widely used as an alternative to direct maximal assessment of lower extremity strength and power [11]. The rate of force development is the development of maximal force in minimal time and is commonly used as an index of explosive strength.

According to [12] volleyball is an intermittent sport that requires players to compete in short, frequent bouts of high-intensity exercise, followed by periods of low-intensity activity. In recent years, an approach called skill-based training has been developed to combine physical skills and conditioning elements in a coordinated approach [13,14]. [13] concluded that skill-based volleyball training improves speed and agility performance, hitting, setting, passing accuracy, passing technique but has little effect on the physiological and anthropometric characteristics of the players. They also stated that skill-based training programs should be supplemented with an appropriate amount of energy system training to improve the physiological and anthropometric characteristics of talented young volleyball players.

The aim of the study is to identify and compare the impact of anthropometric characteristics and physical abilities of volleyball players in the age group of 13-15 years between 2 different volleyball teams. The results of this study may provide coaches with useful indications regarding the selection of young talents based on the knowledge obtained from the evaluation of sports performance and anthropometric characteristics of the players.

II. METHODS

The study method that we have presented was developed with volleyball players between the Two Volleyball Sports Associations in Albania. A total of 30 volleyball players participated. While divided according to; Elbasan Volleyball Sports Association; 15 girls; Dinamo Volleyball Sports Association; 15 girls.

Anthropometric Measurements

Testing and measurement are the means of collecting information on which subsequent performance assessments and decisions are made. Anthropometric measurements will be developed; body height, body weight and Body Mass Index (BMI kg/m2 %).

Tests Protocol

The goal is to lift with maximum explosive force with both feet or steps and touch at the maximum jump height with the hands. The maximum distance between the landing height and the jump height gives the results.

Attack Jump - Height of touch with a dot. The subject was then asked to stand and on command the subject ran towards the wall and jumped with a full action and held a sign near the palm of the hand. A normal volleyball shot run (attack) was allowed. The high jump result was recorded to the nearest cm by subtracting the jump height from the subject's height.

Block Jump - *The subject's reach height with both hands was measured on a wall. The subject was then asked to jump onto the wall by bending both knees and swinging their arms at chest level. The subject jumped and marked the wall with the fingertips of both hands at maximum height. No running or jumping was allowed. The distance between the jump height and the reach height in cm was the test result.*

Agility, Speed, Coordination (motor skills) tests which were taken from the BrayanMac model on the website.

a) Shuttle Run Test 10 x 5 m; The objective of the test is to assess the athlete's ability to accelerate between marked lines and to change direction quickly.

b) T-TEST; The objective of the test is to monitor the development of the athlete's speed with the change of direction.

Statistical Analysis

We used Descriptive Statistical Analysis for both groups of Volleyball Sports Associations taken in the study. Comparison Analysis of the results of jump performance, speed tests and differences between the two groups. The data were processed in Excel.

III. RESULTS

At the end of implementing our study methodology, we have obtained different results for volleyball players from the Two Sports Associations in the 13-15 age group. Below we will

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present the data in tables and graphs according to the study methodology.

Table 1. Anthropometric Data of Girls' Volleyball

Team	Age	BH cm	BW kg	BMI% kg/m^2
Elbasan	15	164 cm	56.13	20.67
Dinamo	15	165cm	53.25	20.23

Table 2. Attack & Block jump performance data

Team	Attack Jump cm	Block Jump cm
Elbasan	233 cm	225 cm
Dinamo	244 cm	236 cm

Table 3. T-Test and 10x5m Run Test Data.

Team	T-Test sec	Run 10 x5m sec
Elbasan	12.28 sec	18.79 sec
Dinamo	13.25 sec	19.73 sec

IV. DISCUTION

Agility and speed are the development trends in the modern sport of volleyball. “Agility” means that athletes must not only be well-prepared for their specific position, but also have high levels of all-round skills in serving, setting, attacking, blocking and defending. “Speed” requires athletes to be able to move quickly to the optimal location on the court. Speed and tactical agility, as key factors, work together to make the unexpected a feature of the modern sport of volleyball [15]. According to [16] it has been concluded that measuring anthropometric characteristics can help coaches in the early stages of identifying volleyball talents.

In this study, height, weight and vertical jump height are usually included as a key factor in identifying talent in young female volleyball players, where similar results have been reported by previous relevant studies [17,18]. The most similar findings were found by [19] in their study where they observed the relationships between 43 anthropometric measurements and 7 physical fitness tests of 32 female volleyball players aged 13-16 years with skills in performing volleyball elements - serve, receive, feint, block and spike.

The changes in the selected parameters were attributed to the proper planning, preparation and execution of the players' training, the findings of this study were similar to the findings of [20,21]. Various studies show with results that specific volleyball training methods are a suitable protocol to improve the speed, agility and explosive power of the legs of volleyball players at the intercollegiate level but also at different levels.

V. CONCLUSION

Based on the measurements of the tests of this study; The tested volleyball players of the two Sports Associations taken into study were found to have no harmful changes in anthropometric measurements, but compared to their age group they have low values in the level of jumping in attack and in blocking. The volleyball players of the two Sports Associations taken into study were found to have low values in the agility tests compared to the references of different studies of this age group. Although they differed between them in small differences. These data can be used and serve coaches to improve their training programs in function of the physical activity of female soccer players according to the game profiles.

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